

PEM005-23

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周期変化する太陽風に対する磁気圏電離圏複合系の応答

Response of the magnetosphere-ionosphere compound system to periodic variation of the solar wind

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Recently, typical magnetospheric phenomena such as a substorm [Tanaka et al., 2010], a sudden commencement [Fujita et al., 2003], a theta aurora [Tanaka et al., 2004] have been investigated intensively by using a realistic global MHD model. These studies revealed the magnetospheric and ionospheric plasma processes occurred during these events in a self-consistent manner. In particular, global current circuits including the current generators are clearly presented at the first time in these studies. By investigating in detail generation mechanisms of the field-aligned current and related shear flow in the magnetosphere, we completely interpret the physical processes of these events. In this sense, generation of a new Region 2 current in the dayside magnetosphere associated with northward turn of the interplanetary magnetic field is a kind of a tutorial phenomenon for comprehension of the magnetosphere-ionosphere compound system. The current generator of this new R2 FAC is driven by plasma convection flow across pressure enhancement in the dayside cleft region. The pressure enhancement in the cleft is also supported by sunward return flow after northward turn of the IMF.

In the talk, we will present deformation of the magnetosphere-ionosphere compound system associated with periodic variations of solar wind IMF based on the concept of the magnetosphere-ionosphere compound system as explained above.

キーワード: 磁気圏電離圏複合系, グローバルシミュレーション, 太陽風周期変動, 磁気圏トポロジー

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